Marijuana

HISTORY

Very Old Drug / Medicine

Assyrians used it for medicine, used it for excitation, have used it in religion. 25th and 24th centuries BC.
Romans

but they used the cannabis as an anti-inflammatory drug.

India

Delivered from all worries and care - Anti-anxiety

Modern Uses for the Cannabis Plant

Industrial
- Paper
- Rope
- Twine
- Basketry
- Yarn
- Ropes
- Twine
- Carpets
- Handicrafts
- Leather
- Furniture
- Textiles
- Carpets
- Twine

Agricultural
- Medicinal
- Food
- Industrial
- Fuels
- Animal feed
- Livestock
- Livestock feed
- Animal feed
- Fuels
- Industrial
- Medicinal

Consumer
- Food
- Beverages
- Beverages
- Beverages
- Beverages
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THC

Cannabinoids

Cannabis

Leaves

Flowers

Seeds

Stalk

Modern Uses for the Cannabis Plant
Sir William Osler – 1st Textbook Internal Medicine

The Principles and Practice of Medicine

Sir William Osler
1849-1919

Marijuana History

The most effective treatment of migraine headaches. Also depression, sleep.
Schedule 1 Controlled Substance

- Schedule 1 controlled substance, such as heroin.
- Based on the 1970 Controlled Substance Act.
- Have a high potential for abuse.
- Have no accepted medical use in the US.
- Have lack of accepted safety under medical supervision.

Marijuana the Pharmaceutical

Legal Medical or Recreational
US Government on MJ Research

- NIDA National Institute for Drug abuse:
  - Study as substance of abuse
  - Not Medical Substance
- Legitimate therapeutic benefit but we have discouraged research
- We should have pharmaceutical cannabis available.

Discovered and Synthesized THC

1964

Dr. Raphael Mechoulam

Israel Marijuana

- Tikun Olam: largest and oldest cannabis dispensary in Israel, now has 15 marijuana plant strains, which are cultivated to have a specific ratio of THC to CBD.
  - Its Avidekel strain has 18% CBD compared to just 0.8% THC - safe for children – not psychoactive
  - Tikun Olam treats more than 200 children with epilepsy with this strain
- Except for Tourette’s syndrome, patients must have tried 4 alternative methods for their pain before getting a medical marijuana license -> last resort.
Inhalation: Absorbed in capillaries
Smoking: inefficient from combustion
Vaporization: heated vapors
Sublingual: tinctures – droppers or sprayed
Oral: pills or mandibles – teas, cookies, brownies however, cannabinoids are fat soluble – thus using cannabis butter
Topical for arthritis and muscle pain.

Cannabinoids

What's it Called
- Aunt Mary
- BC bud
- blunt (cannabis within tobacco)
- boom
- chronic
- dope
- gangster
- ganja
- grass
- hash
- herb
- hydro
- indo
- joint
- kif
- Mary Jane
- ADD
- pot
- reefer
- roach
- sinsemilla
- skunk
- smoke
- weed
- Yerba
- Sh--t
Marijuana

- Marijuana the illicit drug
- Marijuana the medicine

Street Synthetic Cannabinoids

A man prepares to smoke K2, a type of synthetic marijuana, in East Harlem in New York City.

Symptoms of MJ Intoxication

- Euphoria
- Relaxation
- Drowsiness
- Altered sense of time and memory
- Slowed reflexes, impaired motor skills
- Bloodshot eyes, Dry mouth
- Increased appetite
- Cognitive impairments
- Paranoia

Depends on potency + Route of administration
### Potential Side Effects

- Stroke
- Brain damage
- Seizure
- Renal
- Cardiac
- Psychosis
- Tachycardia

### Lancet Study: Marijuana Harm

- Lancet study praised for ruling out 50 confounding factors other than marijuana that explain the results
- Dose response, meaning that the negative outcomes worsened with increased cannabis use:
  - After covariate adjustment, compared with individuals who had never used cannabis,
  - Daily users < age 17 y/o - reduced odds of high-school completion
  - Increased odds of later cannabis dependence
  - Use of other illicit drugs
  - Suicide attempt
- The researchers noted that previous studies published in 1998 and 2000 had shown similar findings.

### Cannabis Use Disorder

- Cannabis use disorder 10% of regular users
  - Cognitive impairment
  - Poor school or work performance
  - Psychiatric comorbidity
    - Mood disorders and psychosis.
    - Psychosocial intervention best
- Acetylcysteine – negative urine tests, recommended
- GABApentin useful.
- Oral delta-9-THC or Dronabinol withdrawal symptoms.
**Medical Marijuana**

- Asthma
- Glaucoma
- Migraines
- Nausea
- Pain
- Tourette’s
- PMS
- Insomnia
- Glioblastoma
- Stress
- Depression
- Anorexia
- HIV
- Fibromyalgia
- Arthritis
- Muscle spasms
- Crohn’s disease
- Epilepsy
- Alzheimer’s
- Opioid addiction

Cannabinoid Receptors in brain, lungs, liver, kidneys, immune system.

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**Assorted Studies**

**International Studies on Cannabis**

- Cannabis use not associated with risk factors for diseases of heart and circulation - *Am J Cardiol*
- Low-dose vaporized cannabis significantly improves neuropathic pain - *J pain*
- Effects of smoked marijuana in healthy and HIV + marijuana smokers. – *J Clin Pharm* – THC most effective but smoking was best tolerated
- Cannabidiol Reduces Intestinal Inflammation through the Control of Neuroimmune Axis (mice and human bowel segments) – *PLoS 2011*
- Acute and subacute bronchial effects of oral cannabinoids – (delta 9-THC not CBD) *Clin Pharm Ther* – Gong, Tashkin 1984
- Marijuana could help fight opioid epidemic Mt Sinai Hosp NY.
Institute of Medicine Report

- Natural role in pain modulation, control of movement, and memory
- Natural role in immune systems likely multi-faceted and remains unclear
- Brain develops tolerance to cannabinoids
- Animal research shows potential for dependence, but less than benzodiazepines or opiate
- Withdrawal symptoms observed in animals but milder than opiates or benzodiazepines, such as diazepam (Valium).

Discovered and Synthesized THC 1964

Dr. Raphael Mechoulam

Dr. Donald Tashkin
30+ years of marijuana research

30 years of research: Studied marijuana vs tobacco
LA tumor registry
- Not lower risk of Cancer, Tobacco 20 fold risk of cancer
- Not risk for COPD
Cancer and HIV Wasting Syndrome

Oncologist: instead of addictive side effects

HIV Wasting Syndrome

Asthma

- Bronchodilator
- Anti-inflammatory

Herbal Basis for Modern Drugs

- Digitalis from foxglove
- Morphine in poppies
- Taxol in the yew tree
- Atropine from belladonna
- Aspirin - American Indians relieved headaches by chewing the bark of the willow tree, Rich in salicylic acid
- Although drugs are synthesized via HiTech, Patients seek alternative, low-technology therapies (back to the roots)
- Cannabis sativa - hemp plant.
Synthetic Cannabinoids
Marinol (Dronabinol)

- THC synthetic
- AntiEmetic
- Side effects: Easy laughing, elation, heightened awareness. Paranoia, somnolence
- Only 10-20% of an oral dose reaches the systemic circulation.

Synthetic Cannabinoids
Other Drugs

- Cesamet (Nabilone), Synthetic cannabinoid - like Marinol treats nausea in chemotherapy patients. - Approved FDA
  Also - muscle pain e.g. Fibromyalgia.
- Sativex
  - used to treat spasticity (muscle spasms and stiffness) caused by multiple sclerosis.
  - It is composed of THC and cannabidiol
  - A spray, approved in 25 countries,
  - not FDA Approved.

Marijuana IOM Report

- basic science - cannabinoids can affect pain transmission
  - cannabinoids interact with the brain’s endogenous opioid system, an important system for medical treatment of pain
  - Bind to receptor. Cannabinoid receptor in the brain is a protein referred to as CB1
- Why does this receptor exist?
  - Endogenous agonist naturally produced in the body -- acting on that receptor.
  - Anandamide
  - Eicosanoids – arachidonic acid
Cannabinoid Receptors

- Cannabinoid receptors CB1 and CB2
- Major endogenous cannabinoids:
  - Anandamide
  - 2-arachidonoyl glycerol
- Endocannabinoid System affects CNS and peripheral processes.

Animal Research

- The non-psychoactive cannabis constituent, cannabidiol, is an oral anti-arthritic therapeutic in murine collagen-induced arthritis (CIA) - Malfait, 2000
- Spontaneous hyper-reactive rats (very impulsive) had a reduced density of CB1 cannabinoid receptors in the prefrontal cortex of the brain.
  - Given synthetic THC – binds to the CB1 receptor
  - normalized the impulsive behavior.

Marijuana Dispensary
There are two basic types of cannabis:
- **Sativa**: more upbeat, cerebral sensation
- **Indica**: more as a pain killer - sedative effect

Where does it come from?
- Growers cooperative
- Grow their own
- Some lab tested and certified.

Marijuana

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<th>Plus</th>
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<td>Health benefits</td>
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Summary

- Rich history of acceptance vs. resistance
- Counter-culture use of a recreational drug
- Counter-culture use of medicinal cannabis
- Research conducted on synthetic THC and cannabidiol
- Research on the plant (herb) itself -> smoking rapid relief
- 700 medical conditions: pain, nausea, cancer, arthritis, glaucoma, seizures, acne, Crohn's disease, ADHD, ...
Summary

- MJ is not dangerous, addictive, gateway, but is DRUG
- Not a panacea but is an herb with specific benefits
- Many kinds have been identified for specific purposes
- Research in USA has been held back: conservative laws
- We have cannabinoid receptors – serve a function
- Evidence is not complete but gathering – Israel
- Illegal nationally but legal in states.

Step Right Up

Thank you!